DICOM Correction Item

CLARIFICATION OF WARNING AND FAILURE STATUS CODES

Numerous definitions can be found for the meaning of warning and failure status codes. In most cases, the definitions are verbatim copies of each other, whereas in other cases, the definitions do not properly fit the given context.

To improve the readability of PS 3.4 Annex H, and to correct, where appropriate, these definitions for warnings/failures, this proposal adds a common definition for Warning/Failure to the front of Annex H, and removes all other definitions except where needed for special handling.

Suggested Wording of Correction

Add the following section:

H.2.5 STATUS CODE CATEGORIES

For every operation requested on a SOP class of the print management service class, a status code will be returned. These status codes are grouped into success, warning or failure categories.

Note: These status codes categories are defined in PS 3.7:

Success - indicates that the SCP performed the requested operation as requested.

Warning - indicates that the SCP has received the request and will process it. However, immediate processing of the request, or processing in the way specified by the SCU, may not be possible. The SCP expects to be able to complete the request without further action by the SCU across the DICOM interface. The exact behavior of the SCP is described in the Conformance Statement.

Failure - indicates that the SCP is unable to perform the request. The request will not be processed unless it is repeated by the SCU at a later time. The exact behavior of the SCP is described in the Conformance Statement.

Modify the affected paragraphs in the following Sections:

H.4.1.2.1.3 Behavior (of CREATE Film Session)

The SCP shall return the status code of the requested SOP Instance creation. The meaning of success, warning, and failure status codes is defined in Section H.2.5. ~~A Failure status code shall indicate that the SCP has not created the SOP Instance.~~

~~A Warning status code shall indicate that the SCP has created the SOP Instance but the SCU has no control over the memory allocation scheme.~~

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H.4.1.2.2.3 Behavior (of N-SET Film Session)

The SCP shall return the status code of the requested SOP Instance creation. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A SUCCESS status code indicates that the SCP has updated the specified Attributes of the SOP Instance. A FAILURE status code indicates that the SCP has not updated the SOP Instance. A WARNING status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.1.2.3.2 Behavior (N-DELETE Basic Film Session)

The SCP shall delete the specified SOP Instance hierarchy. ~~The SCP shall return the status code of the requested SOP Instance hierarchy deletion.~~

The SCP shall not delete Image SOP Instances or VOI LUT Box SOP Instances as long as there are outstanding references to these SOP Instances.

> NOTE: It is beyond the scope of the Standard to specify when the SCP actually deletes the Image SOP Instances or VOI LUT Box SOP Instances.

<u>The SCP shall return the status code of the requested SOP Instance creation. The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not deleted the specified SOP Instance hierarchy.~~

H.4.1.2.4.3 Behavior (of N-ACTION Print Film Session)

The SCP shall return the status code of the requested operation. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Warning status code shall indicate that the SCP is not capable of printing the film session in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

~~A Failure status code shall indicate that the SCP has not printed the film session.~~

H.4.2.2.1.3 Behavior (of N-CREATE Basic Film Box)

The SCP shall return the status code of the requested SOP Instance creation. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

H.4.2.2.2.3 Behavior (of N-SET Film Box)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not updated the SOP Instance. A WARNING status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.2.2.3.1 Behavior (of N-DELETE Film Box

The SCP shall delete the specified SOP Instance hierarchy and shall remove the UID of the deleted Basic Film Box SOP Instance from the list of SOP Instance UIDs of the Film Box UIDs Attribute of the parent Basic Film Session SOP Instance. ~~The SCP shall return the status code of the requested SOP Instance hierarchy deletion.~~

<u>The SCP shall return the status code of the requested SOP Instance hierarchy deletion. The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

H.4.2.2.4.3 Behavior (N-ACTION Film Box)

The SCP shall return the status code of the requested operation. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Warning status code shall indicate that the SCP is not capable of printing the film in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

~~A Failure status code shall indicate that the SCP has not printed the film session.~~

H.4.3.1.2.1.3 Behavior (N-SET Basic Grayscale Image Box)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not updated the SOP Instance. A WARNING status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.3.2.2.1.3 Behavior (N-SET Color Image Box)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not updated the SOP Instance. A Warning status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.3.3.2.1.3 Behavior (N-SET Referenced Image Box SOP)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not updated the SOP Instance. A Warning status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.4.2.1.3 Behavior (N-SET Basic Annotation Box)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not updated the SOP Instance. A Warning status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the Conformance Statement.~~

H.4.5.2.2.2 Behavior (N-GET Print Job SOP)

The SCP shall return the status code of the requested SOP Instance retrieval. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not retrieved the SOP Instance.~~

H.4.6.2.2.2 Behavior (N-GET Printer SOP)

The SCP shall return the status code of the requested SOP Instance retrieval. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

~~A Failure status code shall indicate that the SCP has not retrieved the SOP Instance.~~

H.4.7.2.1.3 Behavior (N-CREATE VOI LUT Box)

The SCP shall return the status code of the requested SOP Instance creation. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

H.4.7.2.2.3 Behavior (N-SET VOI LUT)

The SCP shall return the status code of the requested SOP Instance update. <u>The meaning of success, warning, and failure status codes is defined in Section H.2.5.</u>

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2 ~~A SUCCESS status code indicates that the SCP has updated the specified Attributes of the SOP Instance. A FAILURE status code indicates that the SCP has not updated the SOP Instance. A Warning status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described~~
4 ~~in the Conformance Statement.~~

H.4.7.2.3.2 Behavior (N-DELETE VOI LUT Box)

6 The SCP shall delete the specified VOI LUT Box SOP Instance. ~~The SCP shall return the status code of the requested VOI LUT Box SOP Instance deletion.~~

8 The SCP shall return the status code of the requested VOI LUT Box SOP Instance deletion. The meaning of success, warning, and failure status codes is defined in Section H.2.5.

10 ~~A Failure status code shall indicate that the SCP has not deleted the specified VOI LUT Box SOP Instance.~~

H.4.8.2.1.3 Behavior (N-CREATE Image Overlay Box)

12 The SCP shall return the status code of the requested SOP Instance creation. The meaning of success, warning, and failure status codes is defined in Section H.2.5.

14 **H.4.8.2.2.3 Behavior** (N-SET Image Overlay Box)

The SCP shall return the status code of the requested SOP Instance update. The meaning of success, warning, and
16 failure status codes is defined in Section H.2.5.

18 ~~A Success status code indicates that the SCP has updated the specified Attributes of the SOP Instance. A FAILURE status code indicates that the SCP has not updated the SOP Instance. A Warning status shall indicate that the SCP is not capable of performing the operation in the specified way. The exact behavior of the SCP is described in the~~
20 ~~Conformance Statement.~~

H.4.8.2.3.2 Behavior (N-DELETE Image Overlay Box)

22 The SCP shall delete the specified Image Overlay Box SOP Instance. ~~The SCP shall return the status code of the requested Image Overlay Box SOP Instance deletion.~~

24 The SCP shall return the status code of the requested Image Overlay Box SOP Instance deletion. The meaning of success, warning, and failure status codes is defined in Section H.2.5.

26 ~~A Failure status code shall indicate that the SCP has not deleted the specified Image Overlay Box SOP Instance.~~

NEW WARNING STATUS CODE

28

Part 4 defines a failure code (C603) at the Film Session and Film Box for rejecting a page containing an oversized
30 image.

Since it is possible for some implementations to resolve oversize images at the Image Box level, and for some
32 implementations to demagnify these oversized images, allow C603 at the Image Box and add a warning code.

Modify Tables H.4-4 and H.4.9:

Status	Meaning	Code
Warning	Image size is larger than image box size, the image has been demagnified.	B604

Failure	Image contains more pixels than the printer can print in the image box ~~.~~ Printer cannot demagnify images. ~~Image size is larger than image box size (by using the specified magnification value)~~	C603

2 *Insert in Tables in Sections: H.3.1.2.1.2, H.4.3.2.2.1.2, and H.3.3.2.1.2:*

Status	Meaning	Code
Warning	Image size larger than image box size, the image has been demagnified.	B604
Failure	Image contains more pixels than the printer can print in the image box . Printer cannot demagnify images.	C603

CONTRAST SPECIFICATION THROUGH CONFIGURATION INFORMATION

4

There are two problems with specifying contrast between an SCU and SCP in the current DICOM specification.
6 First, the only mechanism (until the User Preference LUT specification is implemented) is through the Configuration Information which does not precisely define how contrast selection is specified. Second, the
8 configuration information is only defined at the Film Box level, whereas contrast specification may also be needed at the Image Box level.

10 In this correction proposal, a defined term for contrast specification within a configuration information string is defined, and this attribute is repeated at the Image Box level.

12 *Add to the description text for the Configuration Information attribute to Table PS3.3 C.13-3:*

Defined Terms:

14 CS000-CS999: implementation specific curve type.

Note: it is recommended that for SCPs, CS000 represent the lowest contrast and CS999 represent the highest contrast levels
16 available.

Add the following Attribute to Table PS3.3 C.13-5:

Attribute Name	Tag	Description
Configuration Information	(2010,0150)	See Table C.13-3 for description of Configuration Information.

18

Add the following Attribute to Table PS 3.4 H.4-10 (N-SET Image Box):

20

Attribute Name	Tag	Usage SCU/SCP
Configuration Information	(2010,0150)	U/U

22

Retire Image Collision Status Code

Supplement P -- Print Service Class Clarification --5

2 For N-ACTION on the Film Box, failure status code C604: Image position collision : multiple images assigned to single image position is specified. This was an error since there are no known conditions when an image collision
4 could occur. Both SCPs and SCUs are required to implement N-SET on the image box. One of the attributes that is permitted to be N-SET is the image pixel data.

6 It was clearly the intent to allow an implementation where a Film Box is reused for multiple pages of different images. This is the reason N-SET on the image box was made mandatory. A means is provided for the SCU
8 replace old images with new images and to erase images from the previous page that are not intended on the new page.

10 This status code was not removed when we decided to give the SCU the responsibility for assuring that the correct images have been N-SET before the N-ACTION is issued. If collisions were to be detected by the SCP, the failure
12 should have been reported as a result of the N-SET to the second image, not as a result of the N-ACTION on the complete page.

14 *Delete from the Tables in H.4.1.2.4.2 Status and H.4.2.2.4.2 Status*

Status	Meaning	Code
	Image position collision : multiple images assigned to single image position	C604

16

Additional Printer and Print Job Status Info Defined Terms

18 This addition addressed two issues: status of N-GET Responses when status info attributes are not defined and use of different values of status info returned by SCPs,

20 Status info is not defined in some cases of the value of the status attribute. For example, when Printer Status is NORMAL, Printer Status Info is not defined. In this case, the SCP would return a warning code in the N-GET
22 Response indicating that the attribute Printer Status has no value. This is resolved by defining values for the applicable status info attribute for all values of the status attribute.

24 Additional defined terms are specific for the status info attribute. This will result in greater uniformity in the responses from SCPs.

Modify C.13.8 Print Job Module

Attribute Name	Tag	Description
Execution Status Info	(2100,0030)	Additional information about when Execution Status (2100,0020) is PENDING or FAILURE. Defined Term when the Execution Status is DONE or PRINTING: NORMAL Defined Terms when the Execution Status is FAILURE: INVALID PAGE DES = The specified page layout cannot be printed or other page description errors have been detected. INSUFFIC MEMORY = There is not enough memory available to complete this job. See Section C.13.9.1 for additional Defined Terms when the Execution Status is PENDING or FAILURE. Defined Terms when the Execution Status is equal to PENDING: QUEUED = Print Job in queue NO SUPPLY MGZ = Supply magazine not available NO RECEIVE MGZ = Receiver magazine not available SUPPLY EMPTY = Printer is out of film RECEIVER FULL = Film receiver magazine full FILM JAM = Film jam No Defined Terms are currently specified for when the Execution Status is equal to FAILURE.

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Modify C.13.9 Printer Module

Attribute Name	Tag	Description
Printer Status Info	(2110,0020)	Additional information about when Printer Status (2110,0010) is WARNING or FAILURE. Defined Term when the Printer Status is equal to NORMAL: NORMAL See Section C.13.9.1 for Defined Terms when the Printer Status is equal to WARNING or FAILURE Defined Terms when the Printer Status is equal to WARNING: SUPPLY EMPTY = Printer is out of film SUPPLY LOW = Film supply low RECEIVER FULL = Film receiver magazine full FILM JAM = Film Jam No Defined Terms are currently specified for when the Execution Status is equal to FAILURE.

4

Add Section C.13.9.1

2 Additional Defined Terms for Printer Status Info (2110,0020) and Execution Status Info (2100,0030) are:

4

BAD RECEIVE MGZ	There is a problem with the film receive magazine. Films from the printer cannot be transported into the magazine.
BAD SUPPLY MGZ	There is a problem with a film supply magazine. Films from this magazine cannot be transported into the printer.
CALIBRATING	Printer is performing self calibration, it is expected to be available for normal operation shortly.
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.
CHECK SORTER	There is an error in the film sorter.
CHEMICALS EMPTY	There are no processing chemicals in the processor, films will not be printed and processed until the processor is back to normal.
CHEMICALS LOW	The chemical level in the processor is low, if not corrected, it will probably shut down soon.
COVER OPEN	One or more printer or processor covers, drawers, doors are open.
ELEC CONFIG ERR	Printer configured improperly for this job.
ELEC DOWN	Printer is not operating due to some unspecified electrical hardware problem.
ELEC SW ERROR	Printer not operating for some unspecified software error.
EMPTY 8X10	The 8x10 inch film supply magazine is empty.
EMPTY 8X10 BLUE	The 8x10 inch blue film supply magazine is empty.
EMPTY 8X10 CLR	The 8x10 inch clear film supply magazine is empty.
EMPTY 8X10 PAPR	The 8x10 inch paper supply magazine is empty.
EMPTY 10X12	The 10x12 inch film supply magazine is empty.
EMPTY 10X12 BLUE	The 10x12 inch blue film supply magazine is empty.
EMPTY 10X12 CLR	The 10x12 inch clear film supply magazine is empty.
EMPTY 10X12 PAPR	The 10x12 inch paper supply magazine is empty.
EMPTY 10X14	The 10x14 inch film supply magazine is empty.
EMPTY 10X14 BLUE	The 10x14 inch blue film supply magazine is empty.
EMPTY 10X14 CLR	The 10x14 inch clear film supply magazine is empty.
EMPTY 10X14 PAPR	The 10x14 inch paper supply magazine is empty.
EMPTY 11X14	The 11x14 inch film supply magazine is empty.
EMPTY 11X14 BLUE	The 11x14 inch blue film supply magazine is empty.
EMPTY 11X14 CLR	The 11x14 inch clear film supply magazine is empty.
EMPTY 11X14 PAPR	The 11x14 inch paper supply magazine is empty.
EMPTY 14X14	The 14x14 inch film supply magazine is empty.
EMPTY 14X14 BLUE	The 14x14 inch blue film supply magazine is empty.

EMPTY 14X14 CLR	The 14x14 inch clear film supply magazine is empty.
EMPTY 14X14 PAPR	The 14x14 inch paper supply magazine is empty.
EMPTY 14X17	The 14x17 inch film supply magazine is empty.
EMPTY 14X17 BLUE	The 14x17 inch blue film supply magazine is empty.
EMPTY 14X17 CLR	The 14x17 inch clear film supply magazine is empty.
EMPTY 14X17 PAPR	The 14x17 inch paper supply magazine is empty.
EMPTY 24X24	The 24x24 cm film supply magazine is empty.
EMPTY 24X24 BLUE	The 24x24 cm blue film supply magazine is empty.
EMPTY 24X24 CLR	The 24x24 cm clear film supply magazine is empty.
EMPTY 24X24 PAPR	The 24x24 cm paper supply magazine is empty.
EMPTY 24X30	The 24x30 cm film supply magazine is empty.
EMPTY 24X30 BLUE	The 24x30 cm blue film supply magazine is empty.
EMPTY 24X30 CLR	The 24x30 cm clear film supply magazine is empty.
EMPTY 24X30 PAPR	The 24x30 cm paper supply magazine is empty.
EMPTY A4 PAPR	The A4 paper supply magazine is empty.
EMPTY A4 TRANS	The A4 transparency supply magazine is empty.
EXPOSURE FAILURE	The exposure device has failed due to some unspecified reason.
FILM JAM	A film transport error has occurred and a film is jammed in the printer or processor.
FILM TRANSP ERR	There is a malfunction with the film transport, there may or may not be a film jam.
FINISHER EMPTY	The finisher is empty.
FINISHER ERROR	The finisher is not operating due to some unspecified reason.
FINISHER LOW	The finisher is low on supplies
LOW 8X10	The 8x10 inch film supply magazine is low.
LOW 8X10 BLUE	The 8x10 inch blue film supply magazine is on film.
LOW 8X10 CLR	The 8x10 inch clear film supply magazine is low.
LOW 8X10 PAPR	The 8x10 inch paper supply magazine is low.
LOW 10X12	The 10x12 inch film supply magazine is low.
LOW 10X12 BLUE	The 10x12 inch blue film supply magazine is low.
LOW 10X12 CLR	The 10x12 inch clear film supply magazine is low.
LOW 10X12 PAPR	The 10x12 inch paper supply magazine is low.
LOW 10X14	The 10x14 inch film supply magazine is low.
LOW 10X14 BLUE	The 10x14 inch blue film supply magazine is low.
LOW 10X14 CLR	The 10x14 inch clear film supply magazine is low.
LOW 10X14 PAPR	The 10x14 inch paper supply magazine is low.
LOW 11X14	The 11x14 inch film supply magazine is low.
LOW 11X14 BLUE	The 11x14 inch blue film supply magazine is low.
LOW 11X14 CLR	The 11x14 inch clear film supply magazine is low.
LOW 11X14 PAPR	The 11x14 inch paper supply magazine is low.
LOW 14X14	The 14x14 inch film supply magazine is low.

LOW 14X14 BLUE	The 14x14 inch blue film supply magazine is low.
LOW 14X14 CLR	The 14x14 inch clear film supply magazine is low.
LOW 14X14 PAPR	The 14x14 inch paper supply magazine is low.
LOW 14X17	The 14x17 inch film supply magazine is low.
LOW 14X17 BLUE	The 14x17 inch blue film supply magazine is low.
LOW 14X17 CLR	The 14x17 inch clear film supply magazine is low.
LOW 14X17 PAPR	The 14x17 inch paper supply magazine is low.
LOW 24X24	The 24x24 cm film supply magazine is low.
LOW 24X24 BLUE	The 24x24 cm blue film supply magazine is low.
LOW 24X24 CLR	The 24x24 cm clear film supply magazine is low.
LOW 24X24 PAPR	The 24x24 cm paper supply magazine is low.
LOW 24X30	The 24x30 cm film supply magazine is low.
LOW 24X30 BLUE	The 24x30 cm blue film supply magazine is low.
LOW 24X30 CLR	The 24x30 cm clear film supply magazine is low.
LOW 24X30 PAPR	The 24x30 cm paper supply magazine is low.
LOW A4 PAPR	The A4 paper supply magazine is low.
LOW A4 TRANS	The A4 transparency supply magazine is low.
NO RECEIVE MGZ	The film receive magazine not available
NO RIBBON	The ribbon cartridge needs to be replaced.
NO SUPPLY MGZ	The film supply magazine specified for this job is not available.
CHECK PRINTER	The printer is not ready at this time, operator intervention is required to make the printer available.
CHECK PROC	The processor is not ready at this time, operator intervention is required to make the printer available.
PRINTER DOWN	The printer is not operating due to some unspecified reason.
PRINTER INIT	The printer is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.
PRINTER OFFLINE	The printer has been disabled by an operator or service person.
PROC DOWN	The processor is not operating due to some unspecified reason.
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.
RECEIVER FULL	The Film receive magazine is full.
REQ MED NOT INST	The requested film, paper, or other media supply magazine is installed in the printer, but may be available with operator intervention.
REQ MED NOT AVAI	The requested film, paper, or other media requested is not available on this printer.
RIBBON ERROR	There is an unspecified problem with the print ribbon.
SUPPLY EMPTY	The printer is out of film.
SUPPLY LOW	The film supply is low.

UNKNOWN	There is an unspecified problem.